

Electronic Supplementary Information

Fundamental chemistry of iodine; The reaction of di-iodine towards thiourea and its derivatives; formation of aminothiazoles and aminothiadiazaoles through dicationic disulfides.

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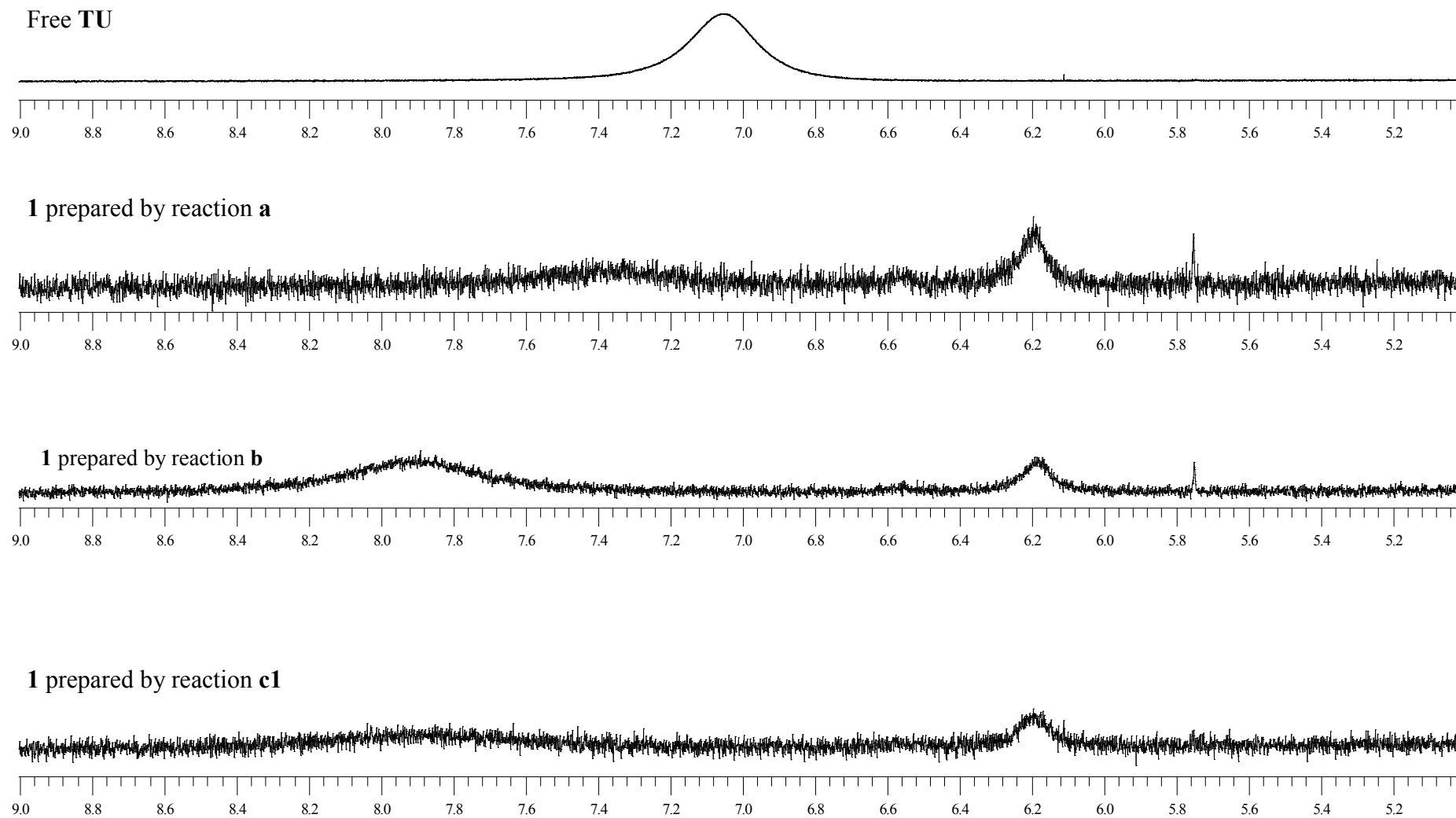


Figure S1. ^1H -NMR spectra of TU and **1** prepared by reactions **a**, **b** and **c1** (Scheme 1) in DMSO-d_6

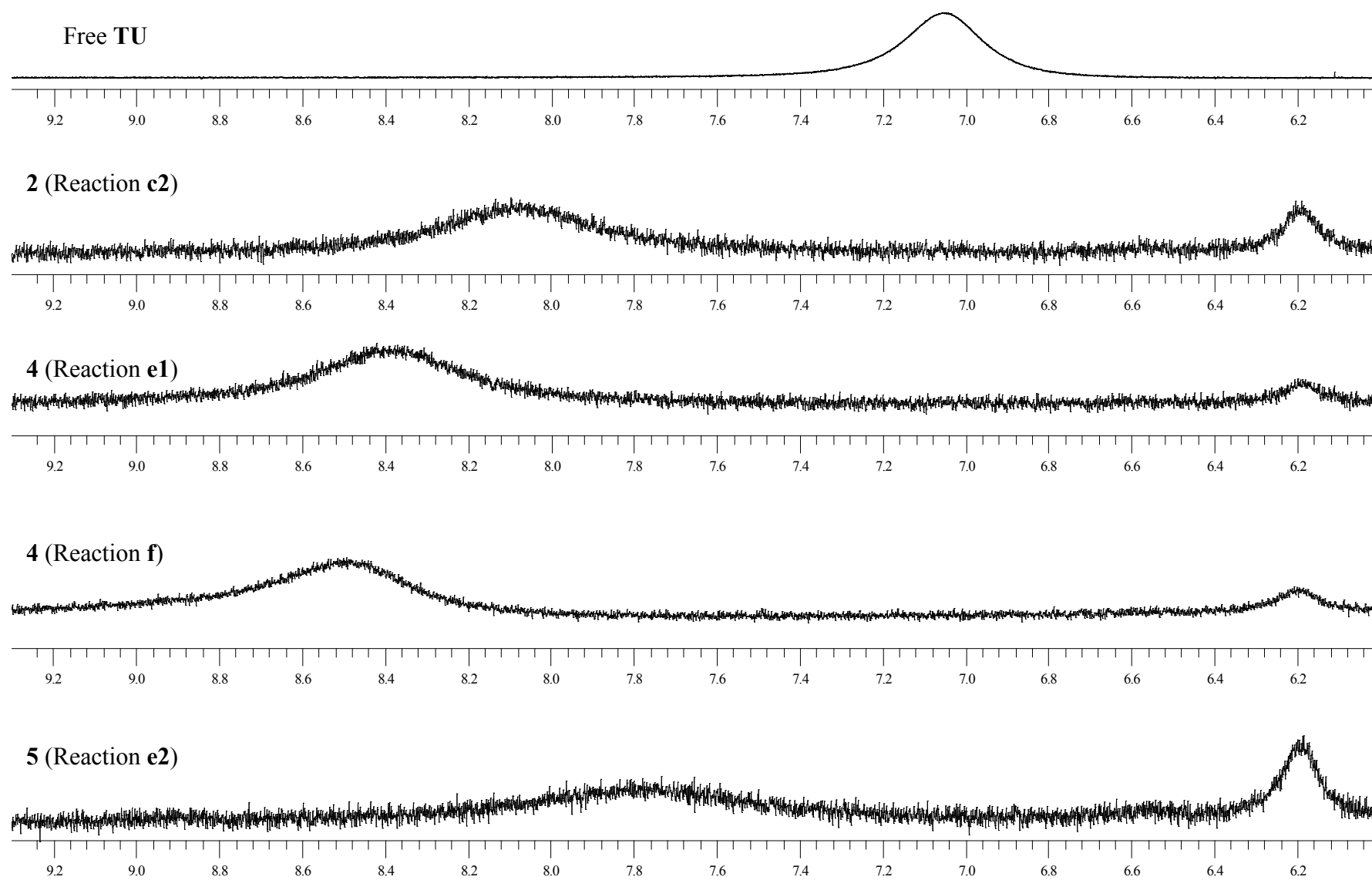


Figure S2. ^1H -NMR spectra of TU and **2**, **4**, **5** (Scheme 1) in DMSO-d_6

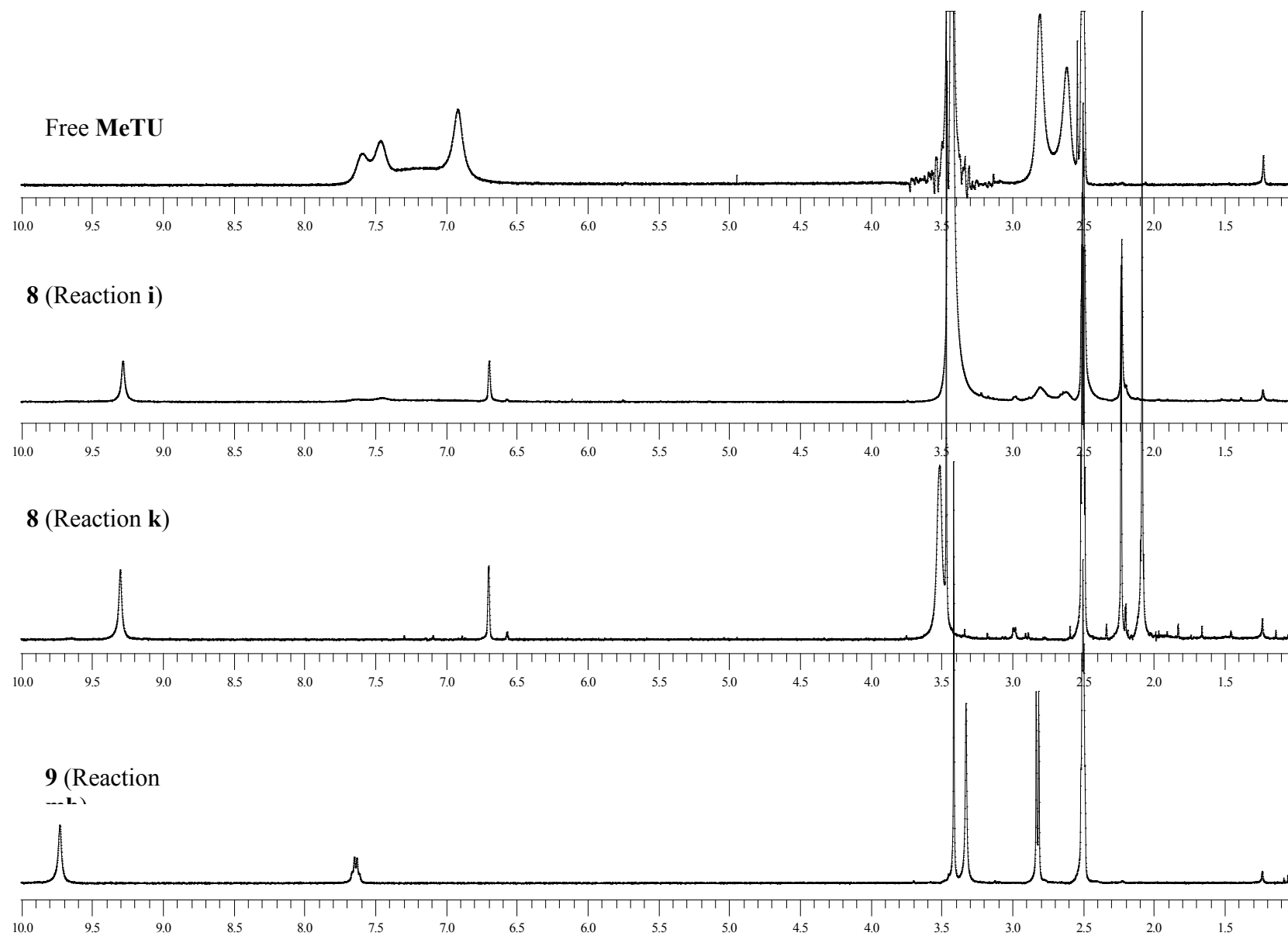


Figure S3. ^1H -NMR spectra of MeTU and **8**, **9** in DMSO-d_6

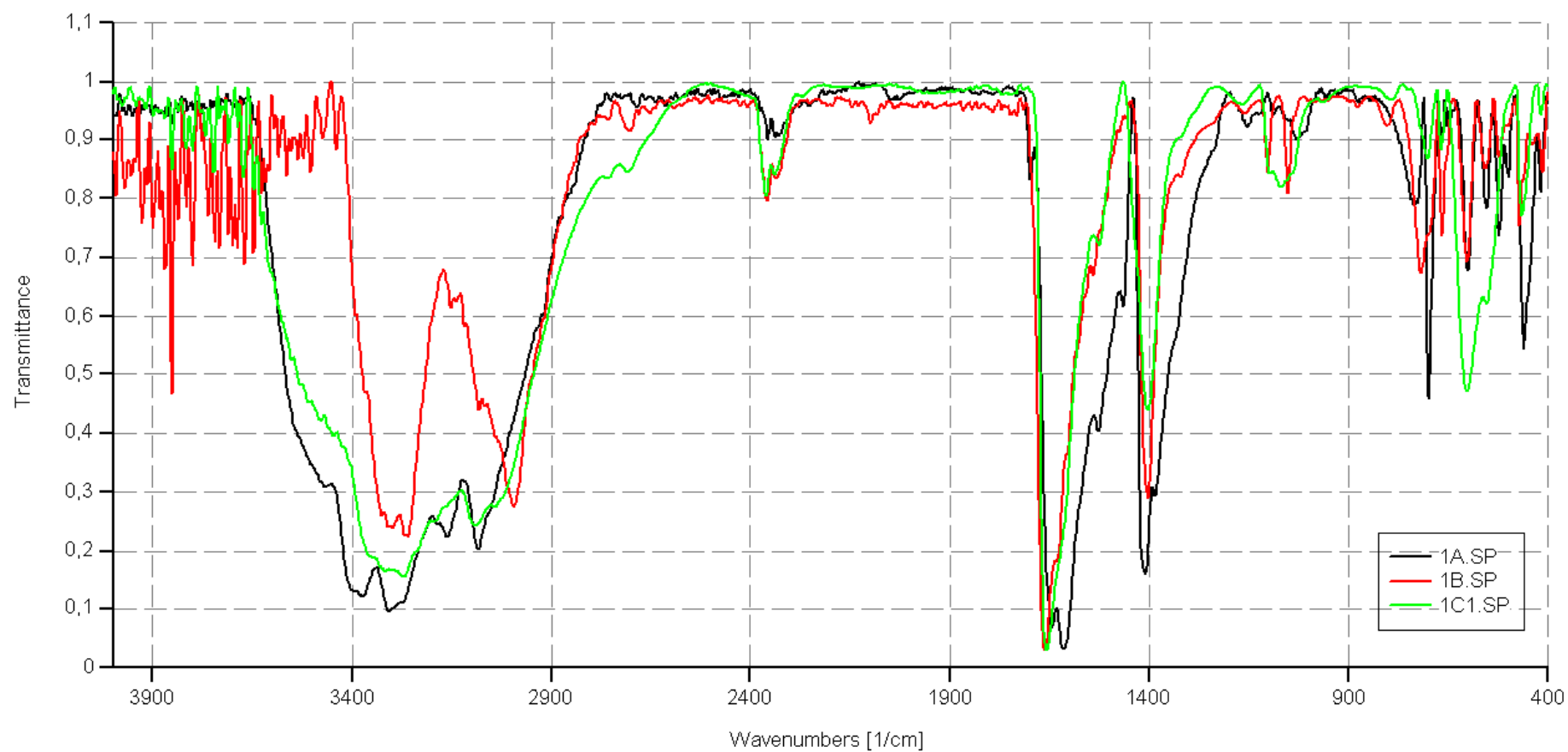


Figure S4. Mid IR spectra of **1** (reactions **a**, **b**, **c1**)

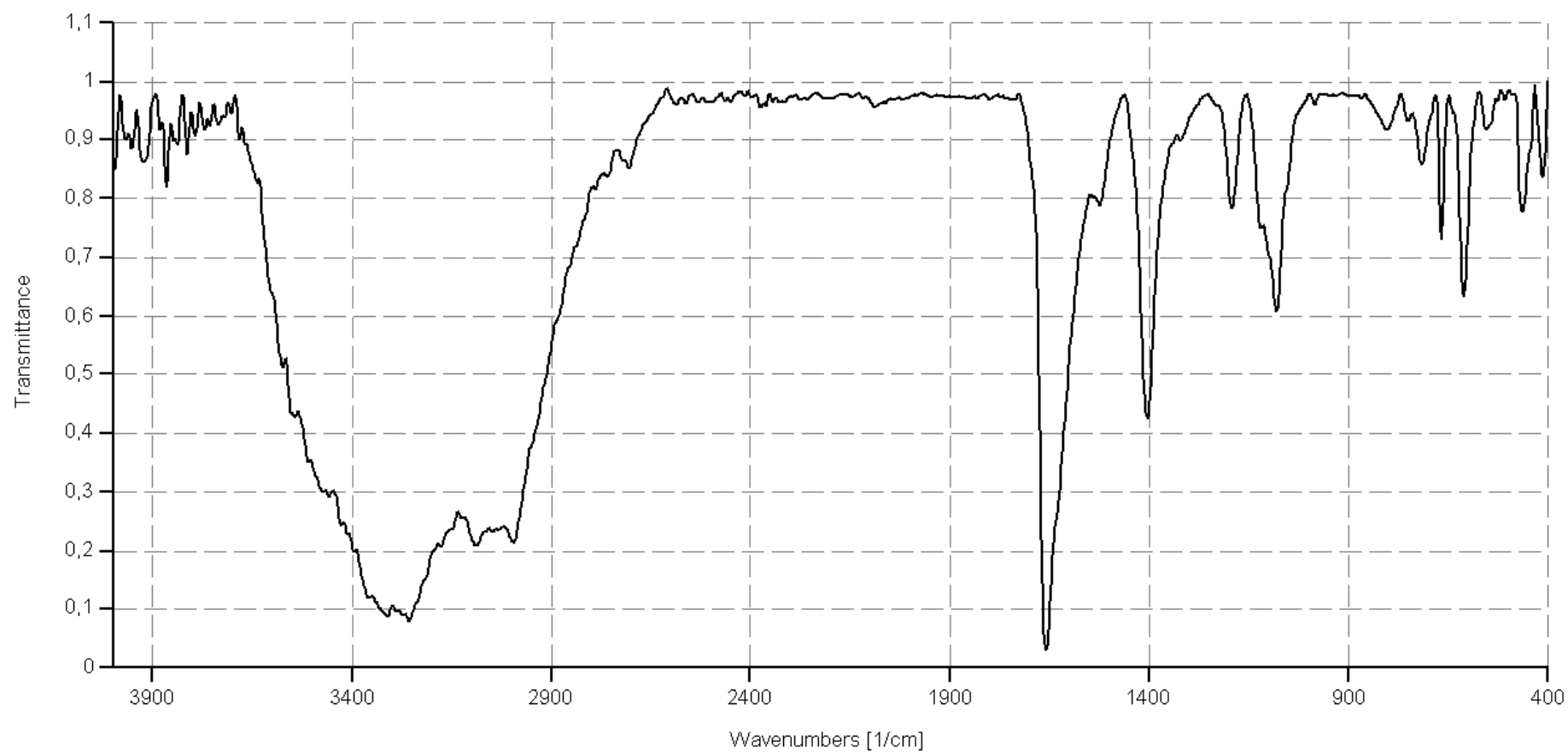


Figure S5. Mid IR spectra of **2** (reaction **c2**)

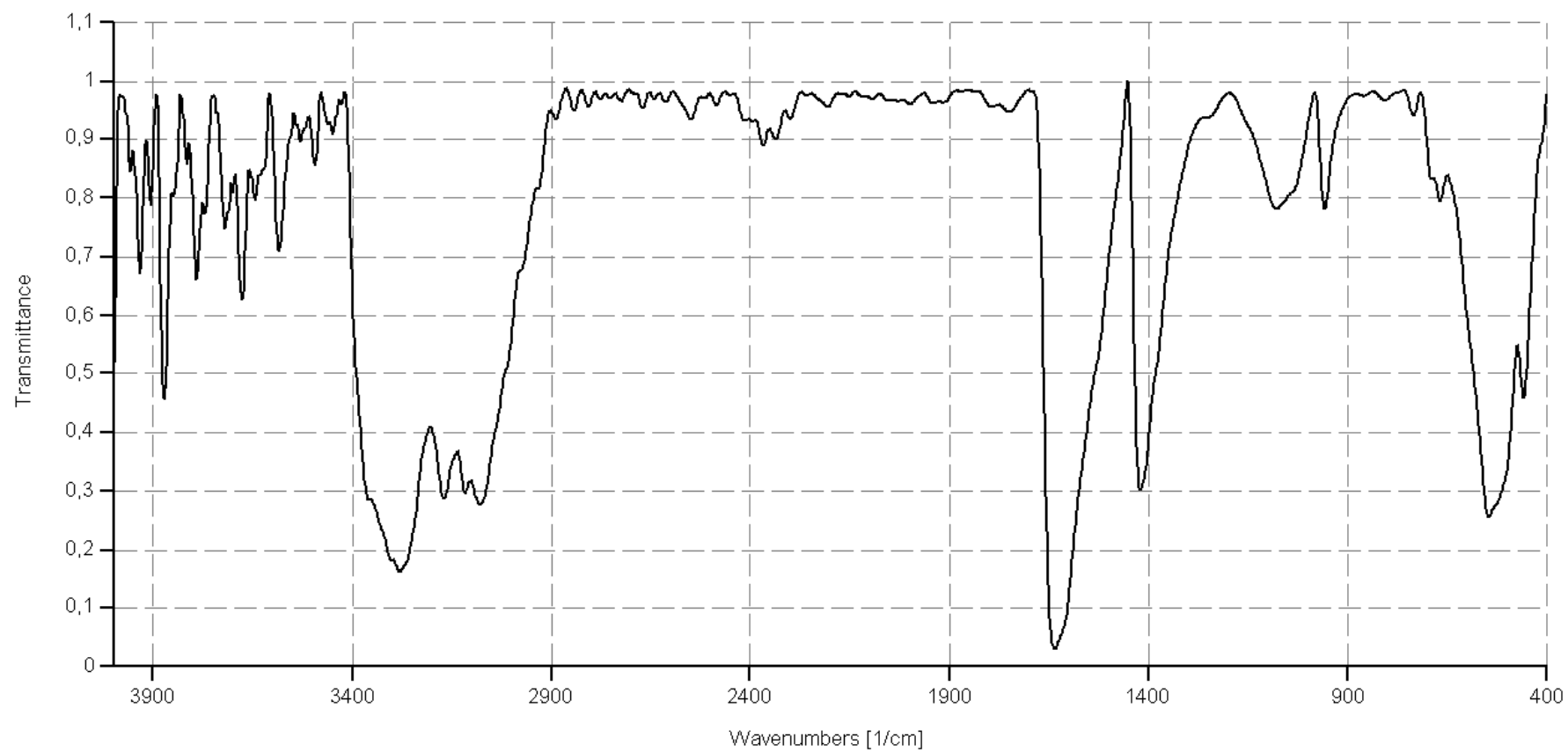


Figure S6. Mid IR spectra of **3** (reaction **d**)

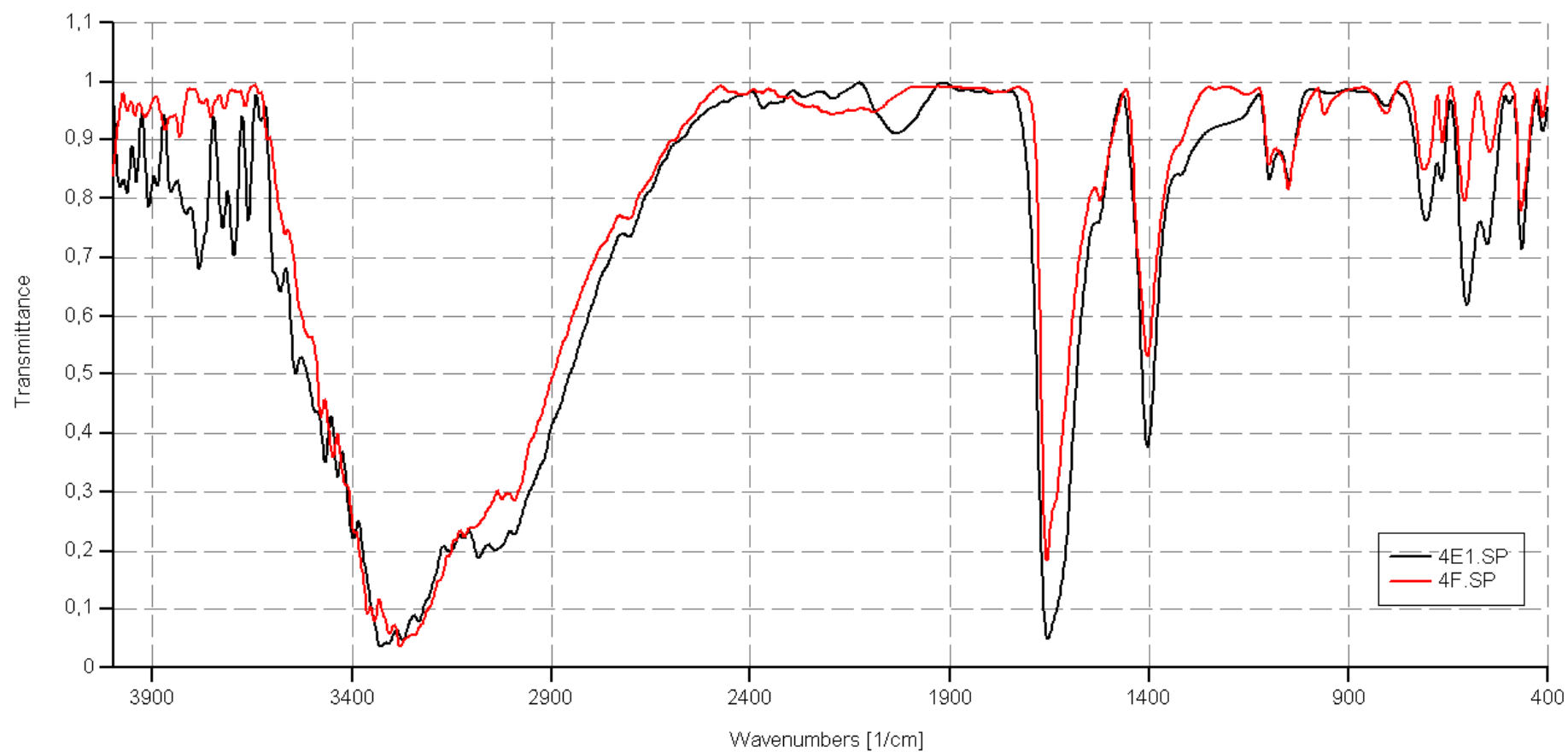


Figure S7. Mid IR spectra of **4** (reactions **e1**, **f**)

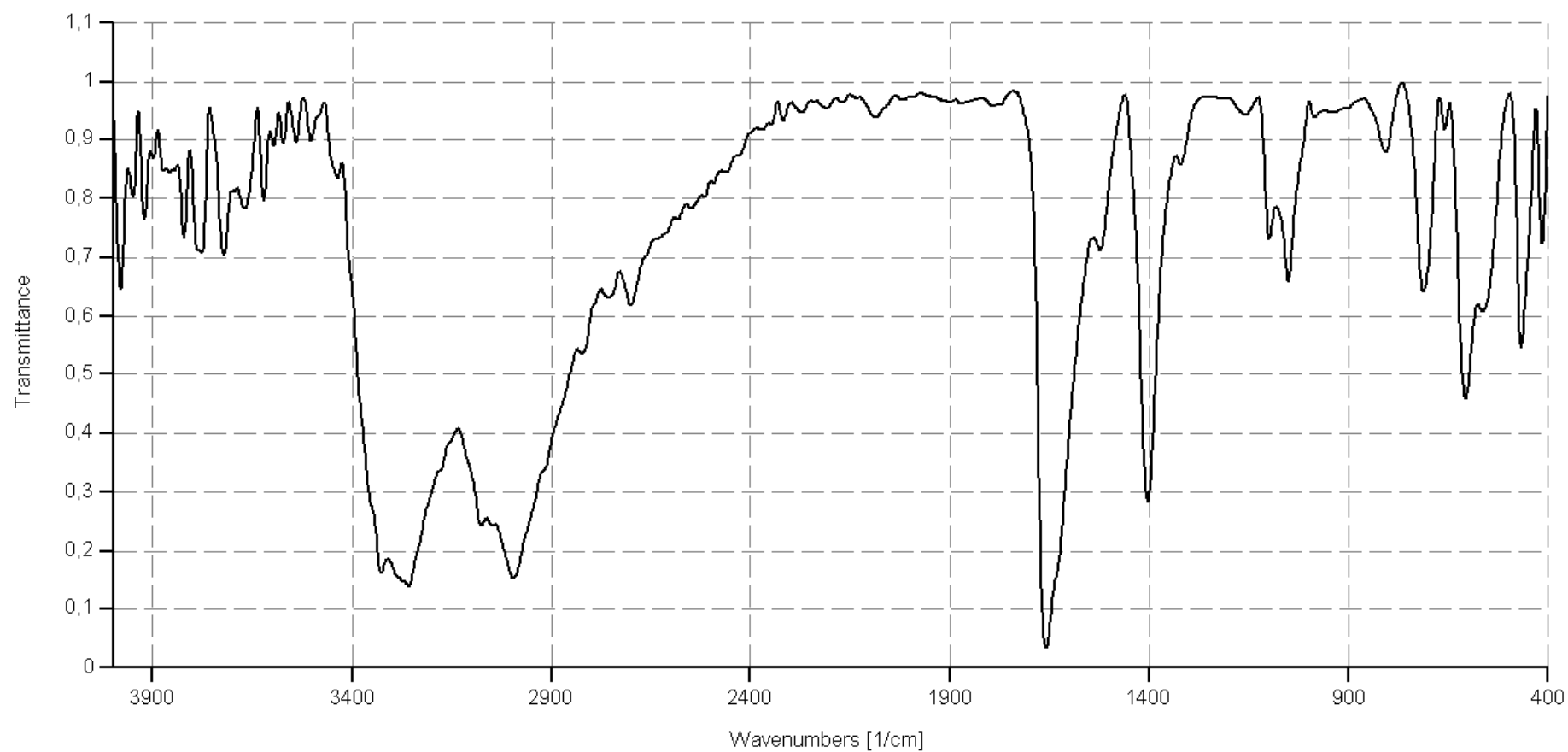


Figure S8. Mid IR spectra of **5** (reaction e2)

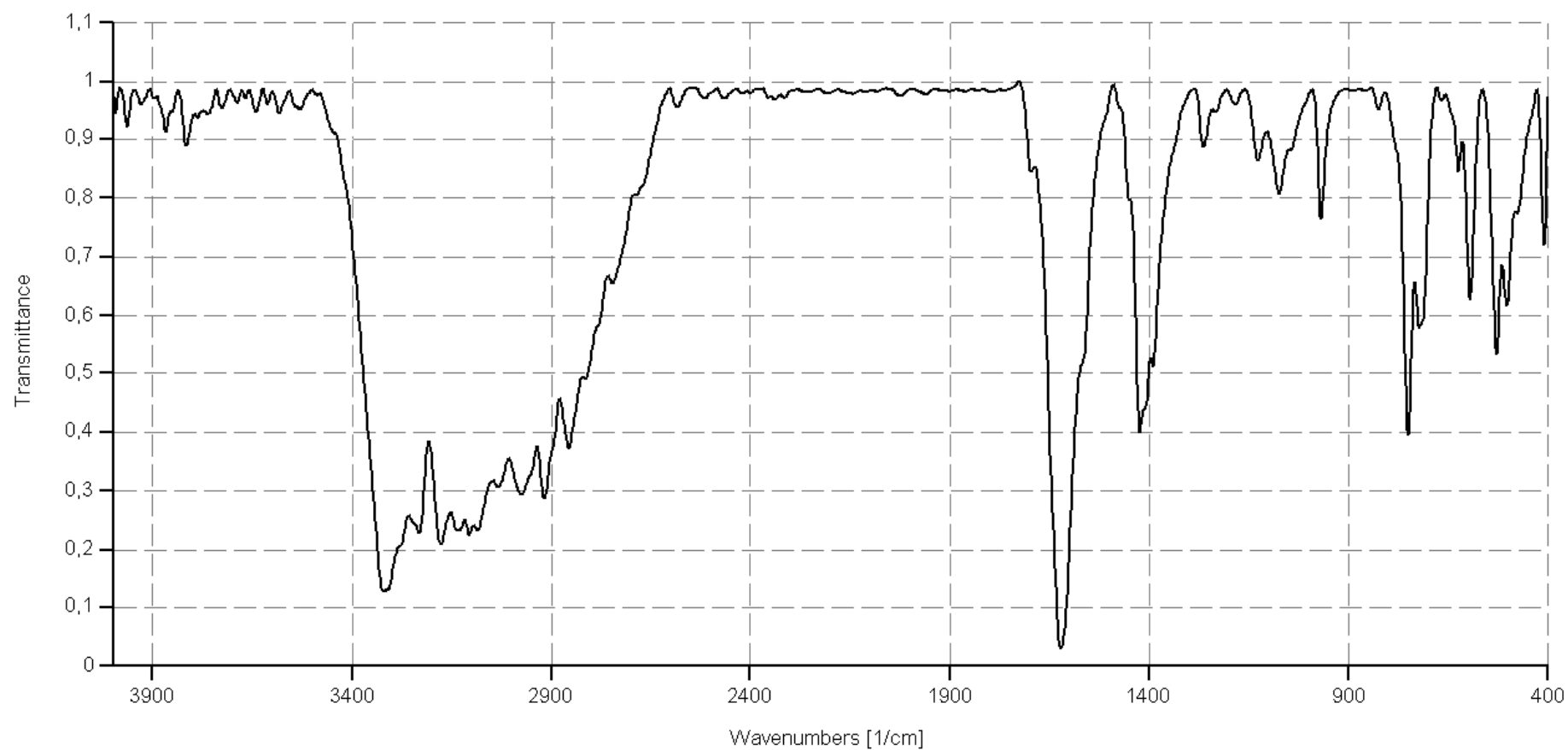


Figure S9. Mid IR spectra of **6** (reaction **g**)

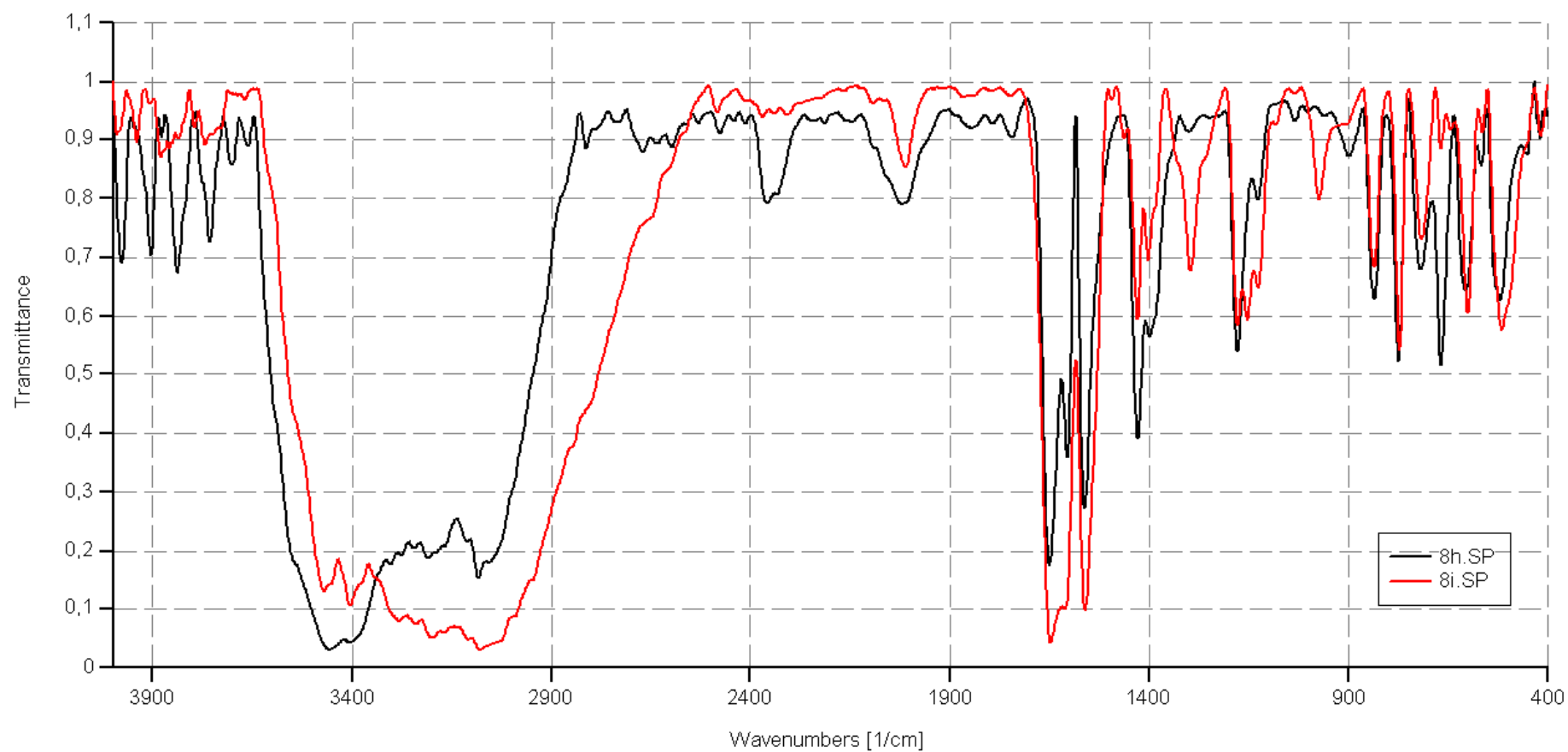


Figure S9. Mid IR spectra of **8** (reaction **i**, **h**)

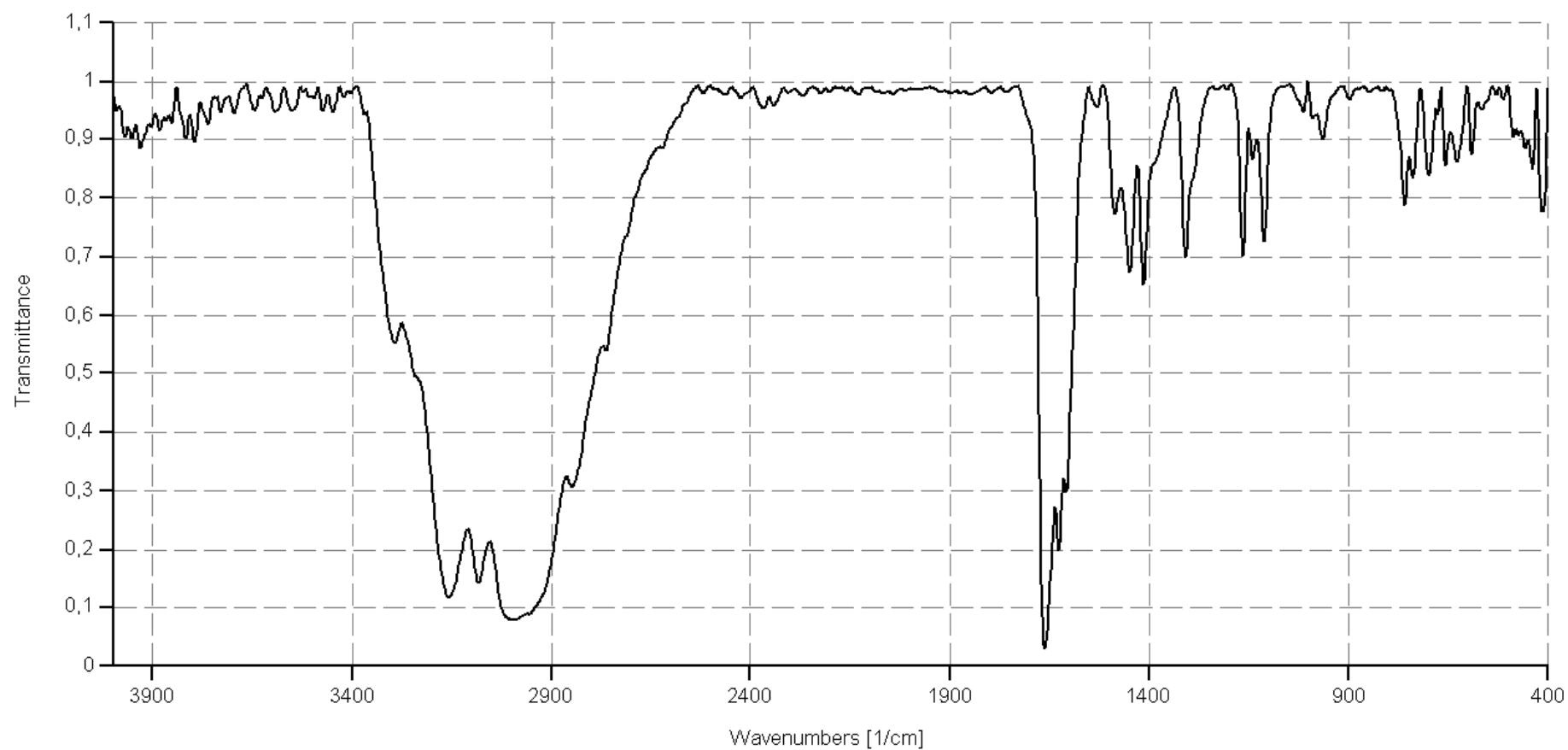


Figure S10. Mid IR spectra of **7** (reaction **h**)

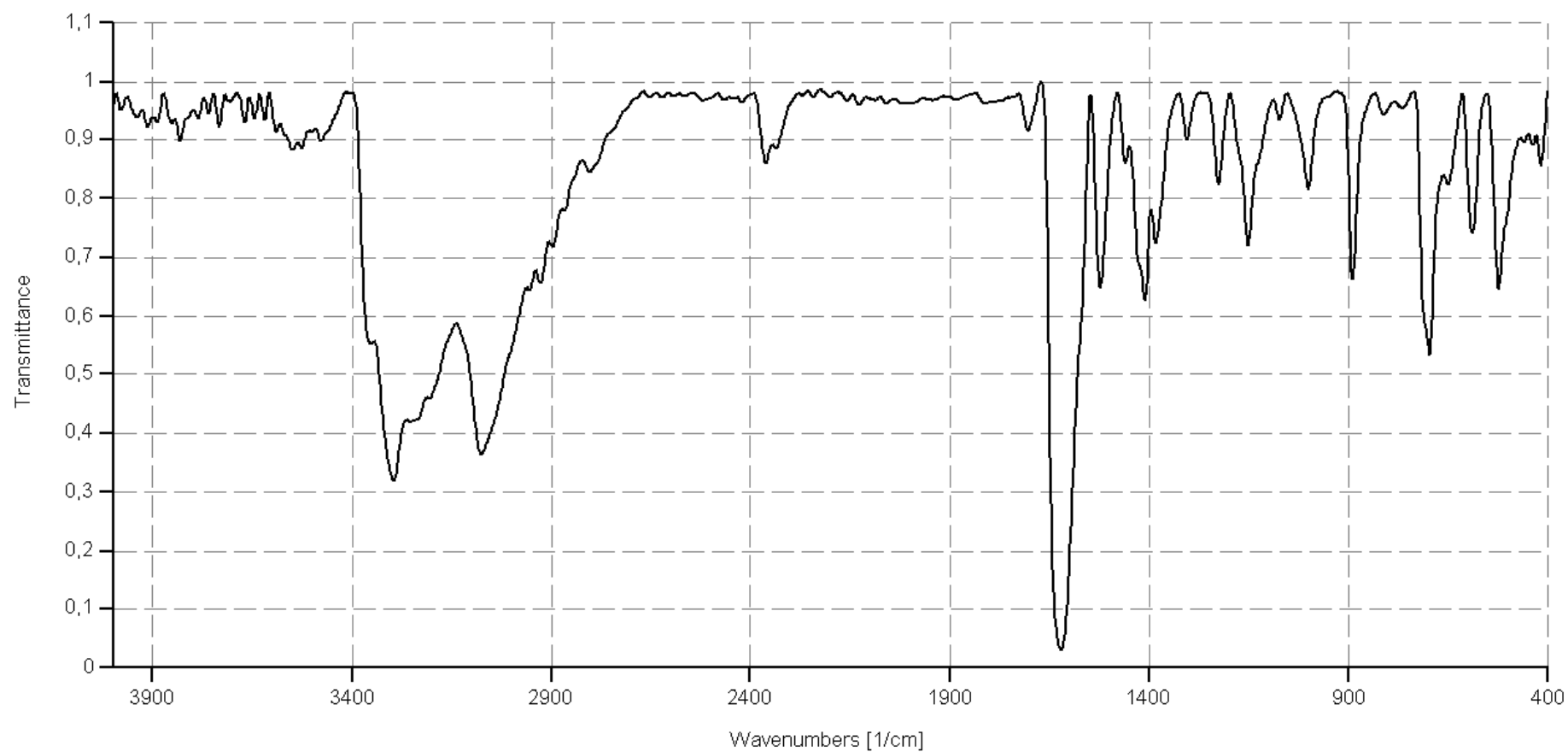


Figure S11 Mid IR spectra of **9** (reaction **m**)

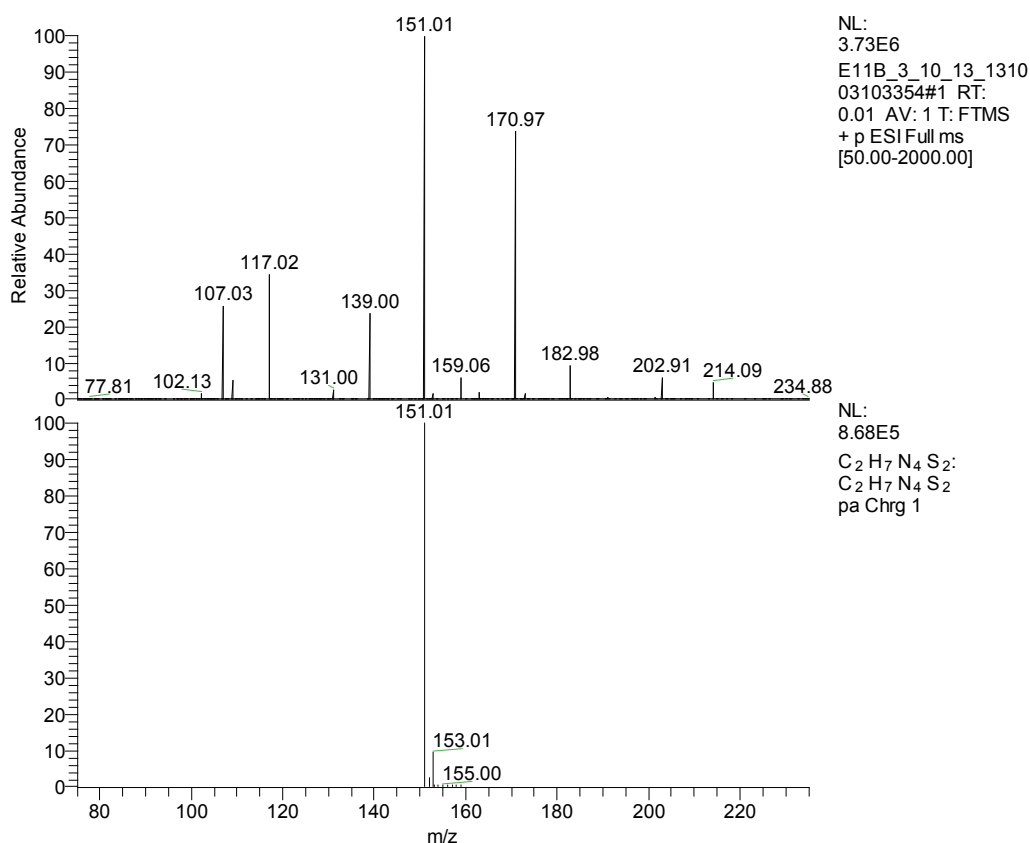


Figure S12. High Resolution Mass Spectrum (HRMS) of $[(\text{NH}_2)_2\text{C-S-S-C}(\text{NH}_2)(=\text{NH})]^+$ fragment in **1** (experimental (upper), simulated (bellow)).

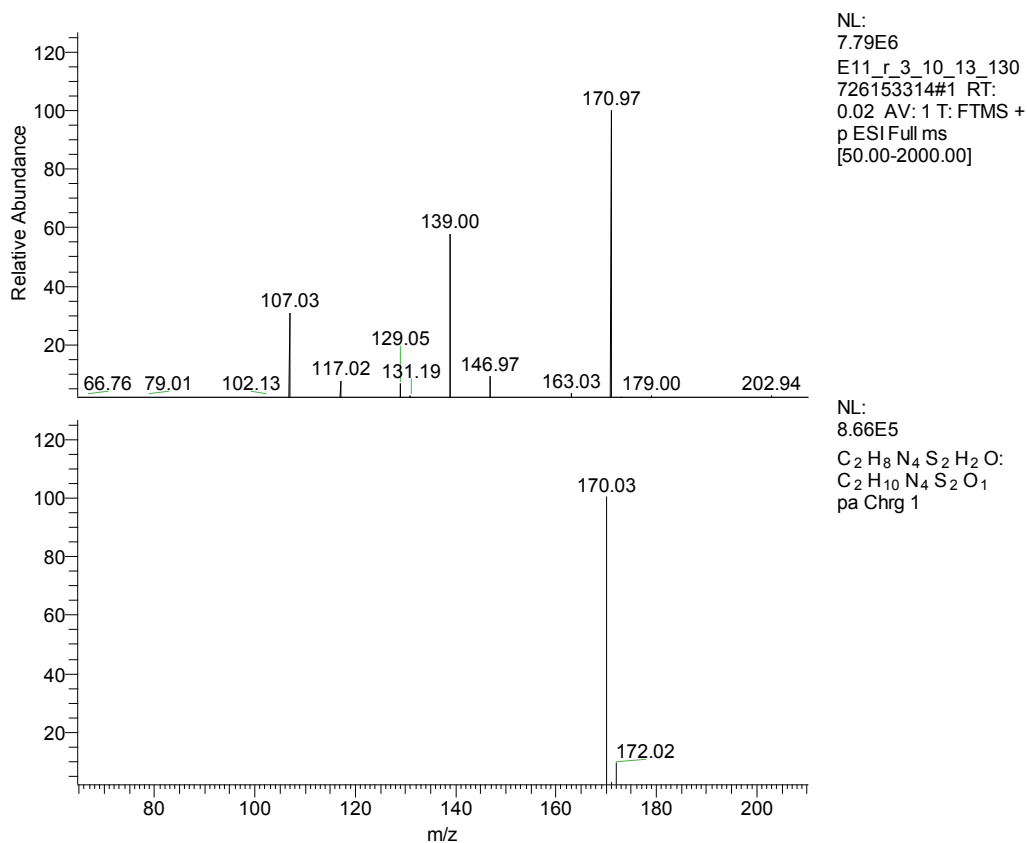


Figure S13. High Resolution Mass Spectrum (HRMS) of $\{[(\text{NH}_2)_2\text{C-S-S-C}(\text{NH}_2)_2] \text{H}_2\text{O}\}^+$ fragment in **2** (experimental (upper), simulated (bellow)).

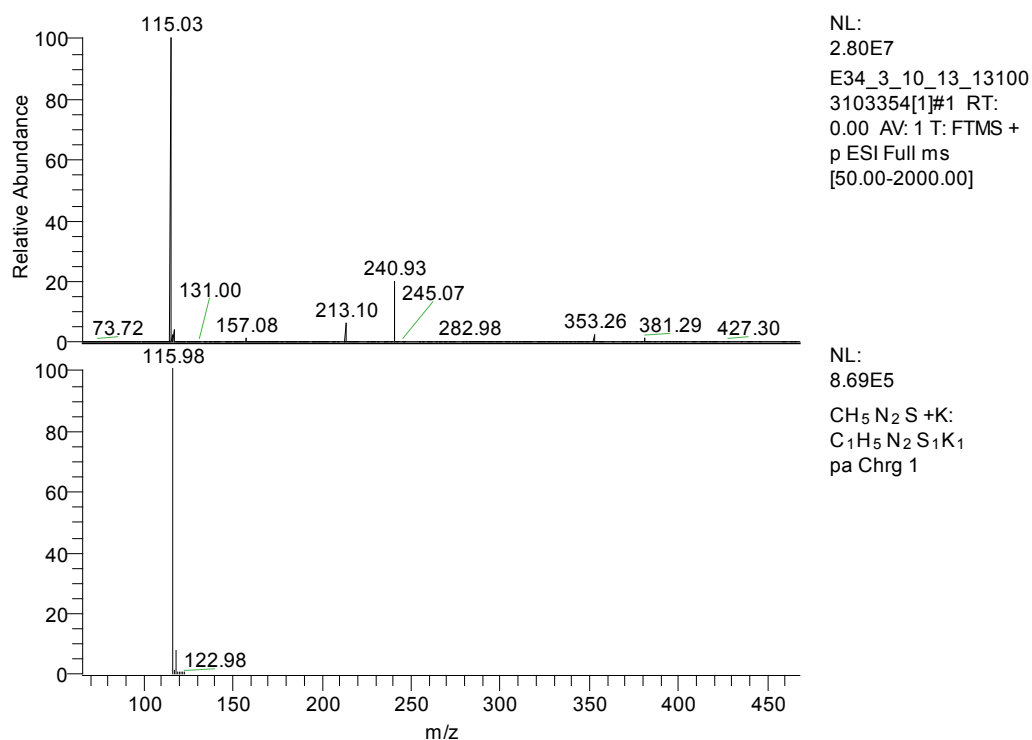


Figure S14. High Resolution Mass Spectrum (HRMS) of {[NH₂]₂C=SH}⁺ fragment in **3** (experimental (upper), simulated (bellow)).

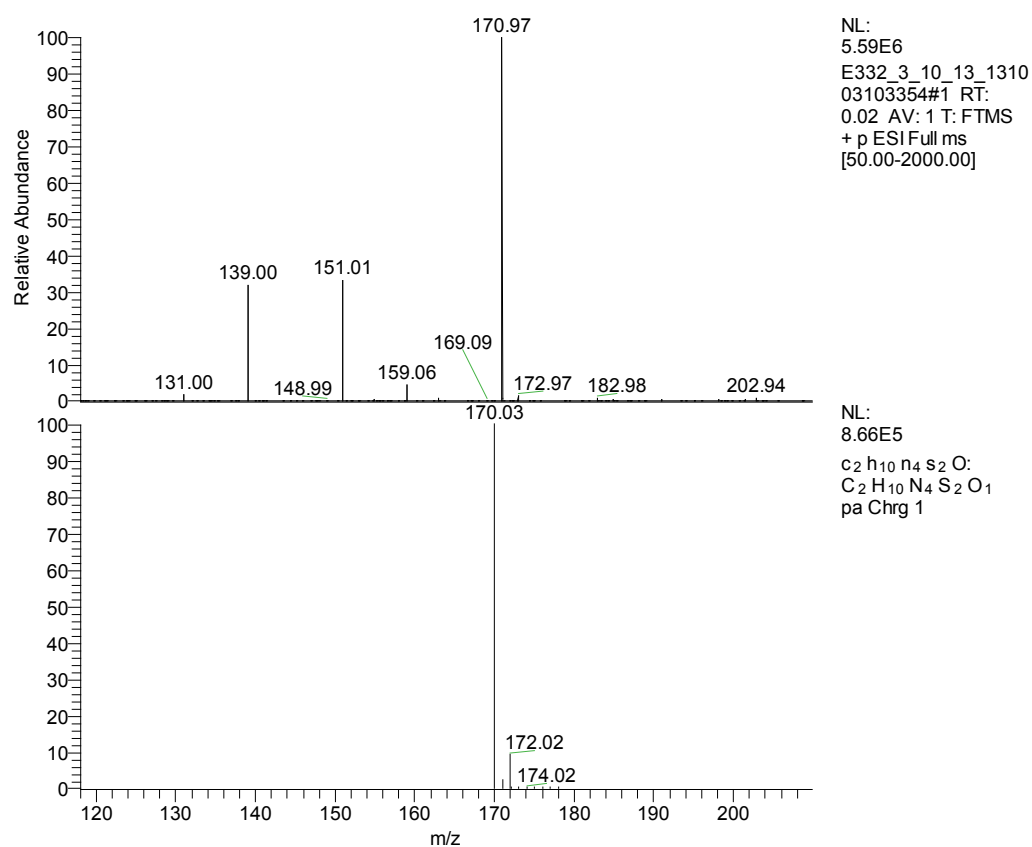


Figure S15. High Resolution Mass Spectrum (HRMS) of {[NH₂]₂C-S-S-C(NH₂)₂} H₂O⁺ fragment in **4** (experimental (upper), simulated (bellow)).

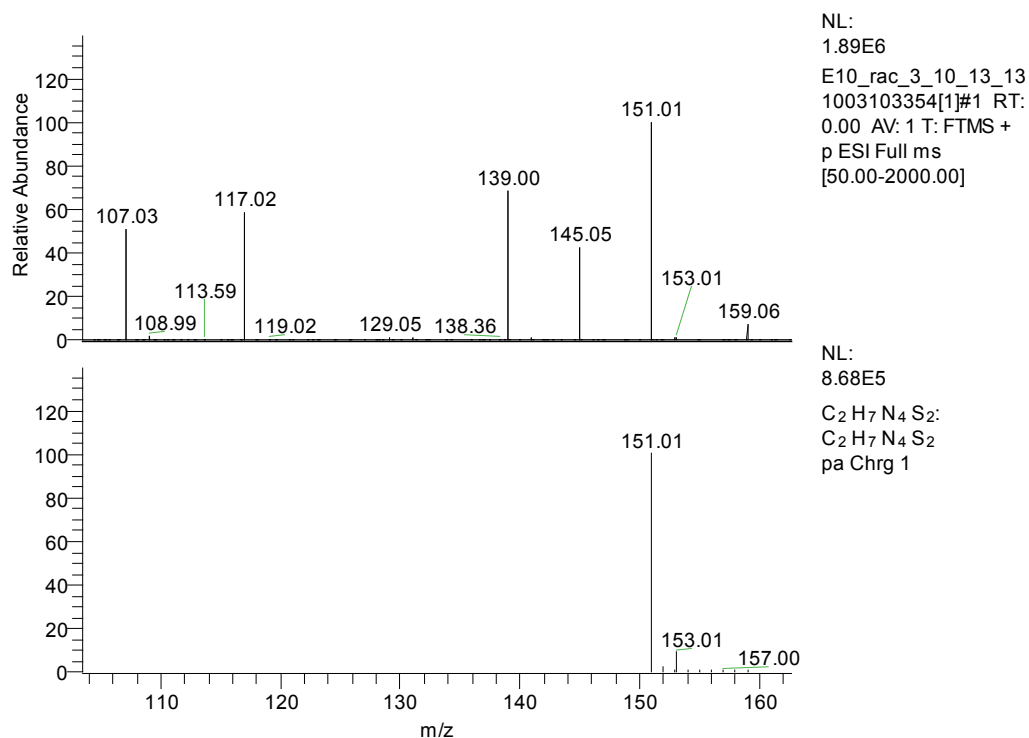


Figure S16. High Resolution Mass Spectrum (HRMS) of $[(\text{NH}_2)_2\text{C-S-S-C}(\text{NH}_2)(=\text{NH})]^+$ fragment in **5** (experimental (upper), simulated (bellow)).

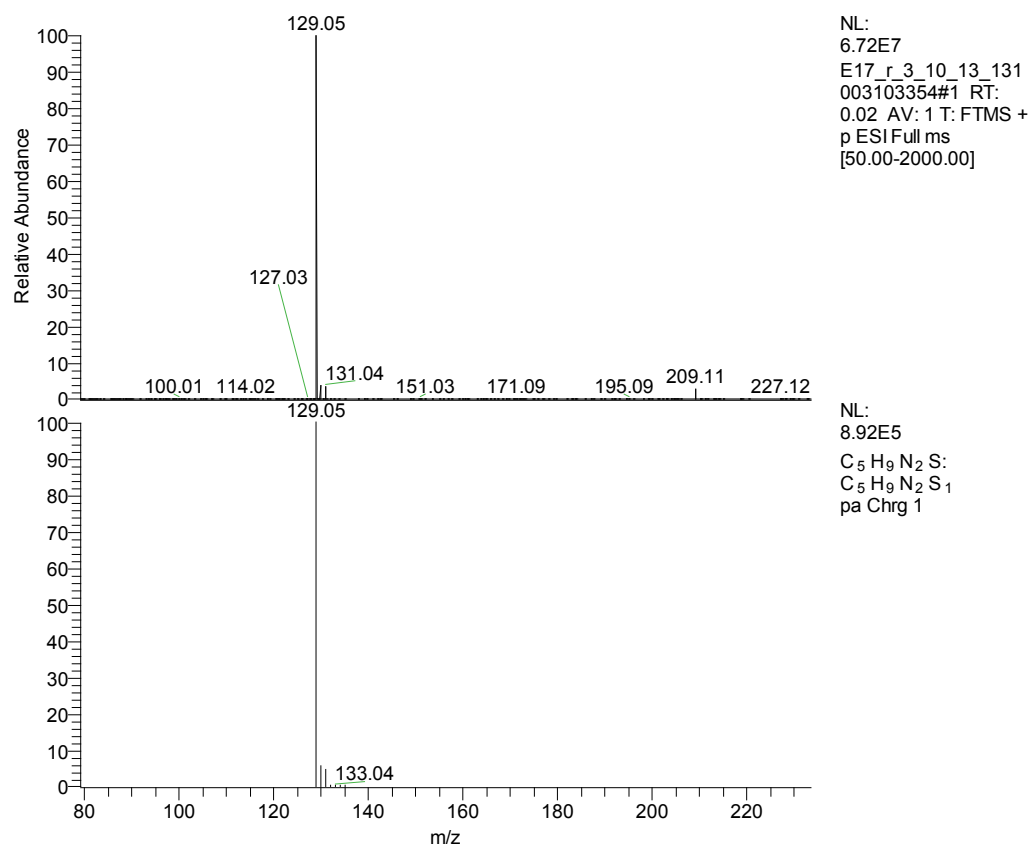


Figure S17. High Resolution Mass Spectrum (HRMS) of $[\text{C}_5\text{H}_9\text{N}_2\text{S}]^+$ fragment in **8** (experimental (upper), simulated (bellow)).

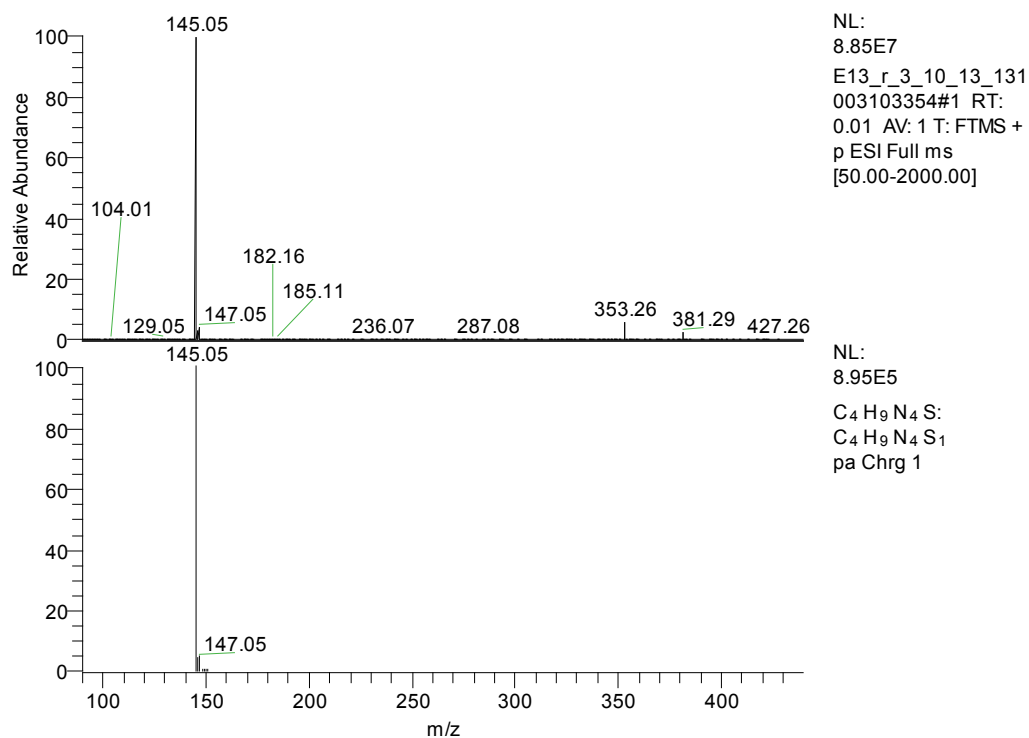


Figure S18. High Resolution Mass Spectrum (HRMS) of $[C_4H_9N_4S]^+$ fragment in **9** (experimental (upper), simulated (bellow)).